PCT/DK03/00142
Rec'd PCT/PTO 07 SEP 2004
10/506817

Kongeriget Danmark

Patent application No.: PA 2002 00352

Date of filing: 07 March 2002

Applicant: (Name and address)
Bang & Olufsen Medicom A/S
c/o Bang & Olufsen Holding A/S
Peter Bangs Vej 15
7600 Struer
Denmark

Title: Method for monitoring taking of drugs from a device and device with means for monitoring and storing drugs.

IPC: -

The attached documents are exact copies of the filed application

PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN COMPLIANCE WITH RULE 17.1(a) OR (b)

Patent- og Varemærkestyrelsen
Økonomi- og Erhvervsministeriet

27 March 2003

Bo Z. Tidemann

PATENT- OG VAREMÆRKESTYRELSEN

METHOD FOR MONITORING TAKING OF DRUGS FROM A DEVICE AND DEVICE WITH MEANS FOR MONITORING AND STORING DRUGS

The present invention relates to a method for monitoring delivery of drugs from a device constituting a storage device for the drugs, said device comprising monitoring means. The invention also relates to a device comprising monitoring means for monitoring taking of drugs and comprising means for storing drugs. The term drugs is used both in sense of a medicament and the like and in the sense of any personal hygienic item.

Any of the functions monitoring, registration, reminding and displaying of compliance in relation to taking of drugs stored in a drug storage device is of importance to a user having to take any kind of drugs. The drugs may be a pharmaceutical drug or a medicament. It may also be other kinds of drugs not being related to any prescription or medication such as nicotine tablets for reducing or supplementing smoking or even other kinds of drugs such as dental chewing gum, or anti-histamine tablets or vitamin pills or the like for promoting health, or still even other kinds of drugs just for enhancing the well-being of the user.

The invention will now be described with reference to the accompanying drawing.

Fig. 1 is depictions of possible devices for increasing the compliance of users having to take any kind of drugs. The means is either a calendar or a holder for writing a shopping list, a picture frame, a mirror or even other devices such as an electronic portable device like a Palm Pilot, a mobile phone, a Walkman®, a Discman®, an MP3 playing device or the like. These means mentioned are all daily life products for daily doings and are often used at least once every day, and if not used as often as the drugs has to be taken, then these means are always nearby, visual, and not hidden to the user. The daily appearance makes it easier for the patient to fit the device into the daily life, and makes the changes caused by a medical treatment less intrusive. Therefore, the device is not hidden in a drawer or a cupboard, but is places out in the open. The philosophy could be expressed as: Keeping it in sight, keeps it in mind!

In the embodiments shown, the drug monitoring system and the drug storage system are not shown. These means may be any suitable means, either means already state of the art or means being part of the present invention, as described later. However, the increased compliance resides in the fact that these means are means already known and already accepted as daily life products. Thus there is no need to persuade the user to use or to have these means at hand, the user already uses these means for other more general daily life doings. Using already known products for also taking drugs will only encourage the user to have these means more at hand, because now the one and same means may be used not only for a primary use such as a drug storing means but also for a secondary use such as a calendar. In the embodiment shown the drugs is stored in a blister card, which is slid into the backside of the device. Thereby the card is hidden, when the device is exposed in a normal living environment. This means that the medical function is not

exposed, and therefore more discrete for the user. The device could also accommodate and cover other types of drug delivery systems, i.e. injection pen, an inhaler, a liquid dispenser etc. etc.

Fig. 2 is a sketch of an even other embodiment of a device according to the invention. The device is a holder for as example a blister card containing the drugs to be taken. The holder is provided with a slot, where the blister card can be inserted. The holder is furthermore provided with illumination devices for reminding the user visually of any drugs, which has to be taken, or as shown in the present embodiment, for showing the user the compliance, which the user fulfils. The compliance may be a compliance related to any target drug having to be taken presently, or it may be compliance related to an overall compliance of all the doses of drugs over a period of time such as a week or a month or a certain shorter or longer period during which drugs must be taken. Compliance related to target drug having to be taken presently, could be represented as a difference in the reminding method according to the time passed since the drugs should ideally have been taken. This could be implemented as a difference in a flashing sequence; the frequency increasing as times passes, or the addition of sound reminders when a certain period of time has passed since the alarm started.

Fig. 3 is a sketch of an even further embodiment of a device according to the invention. The device is a mere holder for a blister card of a certain size. The device is provided with a switch, which is engaged when a blister card is stored in the holder. When the blister card is removed from the holder the switch is disengaged, this being monitored by a timer in the holder. When the blister card is inserted into the holder again, the timer monitors this taking out and replacing of the blister card as an amount of drugs having been taken. Then the timer computes when the next amount of drugs has to be taken according to a drug dosage plan, and the user is reminded according to this drug dosage plan. When the switch is disengaged again, this is monitored as the blister card having been taken out of the holder and compliance having been fulfilled. To avoid a user to achieve a misleading good compliance by pulling the card out a number of times, the removal of the card could be registered as a tablet taken, only if it happens during an active alarm. This reduces the risk of a misleading compliance indication by failed operation, and makes it more cumbersome to cheat the device. This way of detecting the consumption of tablets is rather simple and inexpensive, but still relatively reliable and valuable as a new tool to optimise a treatment, and enable distinction between non-compliers and non-responders.

Fig. 4 is a sketch showing a technically and functionally more sophisticated embodiment of a device according to the invention and being a holder for a blister card containing the drugs. Additional to being a holder for a blister card, the holder also is intended for holding a smart card. Preferably, both the blister card and the smart card are the size of a credit card according to ISO-standard 7810. Thereby it is easy and likely for the user to bring the holder along with other daily use items such as a wallet, a mobile phone and perhaps a credit card holder which may have the size for also holding the device shown in the figure. The holder has two pairs of inner slots along side edges of the holder, one pair of slots for

taking up edges of the blister card, and another pair of slots for taking up edges of the smart card.

The smart card is provided with intelligent computing means comprising a timer capable of monitoring pre-set time intervals and comprising signalling means capable of reminding a user of when to take any drugs. In a preferred and the shown embodiment, the smart card is provided with three tabs each provided with a number, either 80, 85 or 90. These numbers indicate three ways of computing the level of compliance, the numbers indicating the percentage of compliance compared to 100% compliance. Depending on the drugs to be taken, the user having to take the drugs, and other conditions related to the drugs, the compliance may be chosen among the numbers of the tabs. If the compliance level must be as example 90%, then the tab with the number 85 is torn off before usage, and then the smart card will compute the time intervals and the reminding function according to a 90% compliance level. By setting own target, the user is more motivated to reach the level defined as a good or satisfactory compliance.

Alternatively to having a separate smart card with encoding of compliance level and of the time intervals and absolute and/or relative start time and time for delivering drugs, then the blister card itself may contain all or some of these features. Thereby, the smart card may be superfluous. Any coding of the blister card itself may be more directly related to the drugs, the number of tablets contained in the blister card and other conditions which are essential for proper and correct drug administration of the drugs in the blister card in question. The holder for the blister card may still be like the one shown in the figure apart from the inner side edges of the holder only having one pair of grooves for just holding the blister card.

Another alternative way of implementing variable goals for the users, would be to implement the break-off tabs on the device itself. This means that the device is manufactured to reward a certain compliance. After a while, the user can set higher goals by breaking of tabs, which will cause the device to give rewards at a higher level of compliance. This feature is indicated on figure 1b.

All the devices shown may have one or more signalling means capable of reminding the user of taking the drugs either by a visual, an audible or a tactile signal. The visual signal is a lamp lighting red or other colour when the time for delivering the drugs arises. The audible signal may be a siren sounding a warning-like signal. The siren may be adjustable, both in relation to the sound level and the sound produced. The sound produced may also differ depending on when the drugs is taken along a time interval after the time of delivering has been reached. At the beginning of the time interval after the time of delivering has been passed, the audible sound is "pleasant" and/or at a low level. As long as the drugs is not taken and depending on how long time after the time of delivering that the drugs is still not taken, then the audible sound will be less "pleasant", i.e. it will start being more alert-like or alarm-like, and/or the audible sound level will increase either stepwise or gradually. The sound may be a beeping sound or it may be a recording of a

voice or an exclamation. Such an adaptive reminding could also be implemented with visual alarming means, such as light emitting diodes, where a flashing pattern changes over time, as the interval since the start of the alarm gets longer.

In the latter case, either a voice or an exclamation, the sound may be added some humour or a command-like tone so that the sound is personalised in relation to the user utilising the device for taking drugs. By personalising the sound, then the initiative for taking the drugs may be increased. If the sound is a voice it may the voice of a doctor, preferably the user himself or the user's own doctor, motivating the user to take the drugs, and the command being more and more harsh along with the drugs not being taken after the time of delivering has been exceeded. If the sound is added humour it may be an exclamation saying as example "weehaa!" at the beginning of the time interval after the time of delivering has been exceeded and saying as example "wakwakoops!" late in the time interval if the drugs is still not taken. Any personalised voice and command or any personalised exclamation, which the user chooses will add to the personalising of the device and thus to impel to handle the device and the taking of the drugs seriously.

Such sounds could also be attached to the achieved compliance, so that a good compliance causes a positive or rewarding sound to be played; for example the grandson saying: "Well done grandma"; and a poor compliance causes a motivating sound to be played; for example the doctor saying: "I'm sure you can do better than that".

Fig. 5 shows a possible design of display unit for use, when monitoring the dispensing of drugs from the apparatus and thereby the state of compliance of the user. The display unit may display different messages as shown in the different views of the drawing. Some of the different messages tell something about the status of the content of drugs in the dispenser being directly derivable from suitable in the dispenser. Other of the different messages tells the user about a prescribed dosage related to the drugs, and dependant on a specific dosage plan related to the specific user. For the sake of clarity and ease, in the remaining part of the description of fig. 6, by way of example only the drugs will be exemplified as a tablet and the drug container will be exemplified as a blister pack containing the tablets. However, as mentioned, this is only one example of different drugs in different drug containers.

Telling about the actual directly derivable status of the content of the dispenser is of course important in order to ensure that the dispenser may be loaded or reloaded with a blister pack when the last tablet has been taken. Telling the user about as example when to take the next tablet, whether the tablet has been taken within a proper time interval etc. is important to ensure proper and correct drugs if the tablets constitute part of a drugs. This is especially important if a dosage plan is prescribed by a doctor.

In the following, without specific reference to any of the display views in fig. 6, we will list the possible display facilities shown in one or more of the display views.

a) Showing the amount of tablets left in the dispenser. If the blister pack has just been loaded into the dispenser, an indication of all tablets is shown. The indication may be graphical as shown in the display views, but may also be numerical indicating the exact number of tablets left by way of displaying an exact value, or indicating the relative number of tablets left by way of displaying a percent ratio.

b) Showing the time left until the first tablet or the next tablet has to be taken. The indication may be in days, in hours, in minutes or any other relevant indication of a measure of time depending on the dosage plan according to which the tablets are to be taken. There is a possibility of the indication shifting from one measure of time to another, as example from hours to minutes when the time of dosage approaches.

c) Showing an interval within which a fixed time of dosage lies, and showing a partial initial time interval before a fixed time of dosage, being a fixed time, arrives and showing a partial subsequent time interval after the fixed time of dosage has passed. The partial intervals are preferably dynamical in the sense that a countdown takes place during the partial intervals. During the initial time interval before the fixed time of dosage, the countdown takes place from as example 90 minutes before the fixed time of dosage and downwards to the time of dosage measured as a difference between the start of the initial time interval and the fixed time of dosage. During the subsequent interval after the fixed time of dosage, the countdown takes place from the time of dosage and downwards as a difference between the maximum time interval of the subsequent interval after the time of dosage to the actual present time within the subsequent time interval.

d) During the initial interval a smiling face, a plus (+), a green or yellow light, or any other indication of a positive status, or at least a non-negative status, may be indicated showing that the user is approaching the time of dosage but has not yet passed the time of dosage. Contrary hereto, during the subsequent interval a sad face, a minus (-), a red or yellow light, or any other indication of a negative status, or at least a non-positive status, may be indicated showing that the user has passed the time of dosage and is approaching the end of the subsequent interval of time.

e) Alternatively to indicating a purely non-negative state during the initial interval and a purely non-positive state during the subsequent interval, it is possible to combine the signs for a non-negative state with the signs of the non-positive state during the subsequent interval, thereby indicating that compliance with the dosage plan still can be maintained but is about to run out. When a dosage within the dosage plan after the subsequent interval no longer can be maintained because the tablet has not been taken within the interval of drugs, then the display view may switch to showing only the non-positive state.

f) Showing the non-positive state all time until the next tablet has to be taken and until the relevant initial interval before the time of dosage of the next tablet is reached. Maintaining showing the non-positive state, i.e. bad compliance with the dosage plan, tells the user to take care until the next number tablets have been taken. Also, if bad

compliance is showed, if the dosages as example are heart pills or the like, and the user gets ill, then any person perhaps attending the user can see from the display that the cause of illness is bad compliance. The person attending the user can also see when compliance can be re-established, namely when the next tablet may be taken at the beginning of the partial initial time interval before the fixed time of the next dosage.

g) A general symbol neither indicating good or bad compliance during the initial and subsequent interval, respectively, but indicating that the actual present time is within the total time interval encompassing the fixed time of dosage. However, in stead of combing the indication of good compliance and bad compliance as mentioned above as an alternative solution, the general symbol may be used to indicate the switch from the initial interval to the subsequent interval, as example by switching from a green light to a red light and/or switching from a constant light to a flashing light.

h) The display will need electrical power. This can be derived from a number of batteries, from solar cells or from the electrical network. The latter solution cannot be used if the dispenser is used as a portable dispenser, but may in this case be used to charge rechargeable batteries in the dispenser. The display may be provided with any kind of battery indicator showing that the batteries need to be changed or need to be recharged. Depending on the degree of safety of the dispenser, the battery indicator may show for how long the batteries is capable of maintaining powering the display. This will establish a high degree of safety towards the lifetime of the batteries running out. Alternatively, the battery indicator may show when the batteries need to be changed or re-charged, but not showing how much lifetime the batteries have left. This will establish o lower degree of safety towards the lifetime of the batteries running out.

i) The dispenser is, as mentioned, preferably provided with an indication of how many tablets are left in the blister pack in the dispenser. As a supplement, the display may have an indication of when the blister pack has to be changed. This will of course be when the last tablet has been taken. A symbol having arrows may be used to indicate that a replacement has to be made, or a flashing light or just a permanent indication may be used warning the user of the replacement needed. The indication of the replacement needed may be combined with the indication of how much time is left until the next tablet has to be taken. The user will then know that the blister pack has to be changed before the time left runs out.

All of the different indications mentioned above under item a)-i), may be used voluntarily so that the display may be capable of showing all or showing just some of the indications mentioned. The display may be provided as an integral part of the dispenser itself or may be a remote display needing data from the dispenser before the so-called dosage history can be viewed. Viewing the dosage history makes it possible to evaluate the compliance during the selected periods of time during which dosages have been taken using the dispenser.

The possibility of transferring the data monitored in connection with the dosage history as example by providing the dispenser with a transponder may be advantageous when a doctor has to evaluate the dosage history. Furthermore, depending on the user and the type of dosage, there may be indications related to the prescribed dosage plan, that the user have no interest in knowing and which therefore need not be shown in a display connected to or constituting a part of the dispenser.

The dispenser may be used for many types of tablets in a blister pack. One example is tablets used by former smokers to avoid smoking, the tablets containing a small amount of nicotine. Taking of such tablets need not be taken using a dosage plan, the tablets may be taken whenever the user feels the need. In this case none of the indications in the display will be necessary. Another example is tablets preventing pregnancy. These tablets must be taken every day, and accordingly some of the indications on the display may be helpful in remembering taking the tablets. A further example may be tablets as drugs of diabetics, heart trouble or any other diseases which may not be lethal if one of the tablets are not taken but which however needs a regular dosage plan. These tablets need at least some of the indications in the display, but preferably all of the indications can be used. A still more used drugs is anti-depressive drugs which need be taken regularly in order to limit depressions, and which have to be taken at different time intervals during start up of the drugs, during regular drugs and during finishing of the drugs. It will be possible to regularly change the dosage plan in order to change the drugs. A still further example may be tablets of drugs of more severe diseases, where it may be lethal if the tablets are not taken at prescribed times.

Monitoring the actual direct status of the dispenser and monitoring the compliance may take place by any suitable means. The display may, as mentioned, constitute a part of the dispenser. However, alternatively the display may be connected to the dispenser either physically by a permanent or detachable wiring or non-physically by means of wire-less signals either to a separate display unit or perhaps to a mobile phone or any other means of receiving wire-less signals.

Using wire-less signals to transmit the monitoring of compliance has the advantage that means for receiving messages that may be more frequently used than the dispenser, such as a mobile phone, will constitute the display means. This will increase the safety of the user taking the tablets at the prescribed times of drugs and thereby maintaining proper compliance. Furthermore, it will be possible for others than the user to monitor the compliance of the user, perhaps a doctor or other supervisor related to the dosage plan.

CLAIMS

1. A method for monitoring delivery of drugs from a device constituting a storage device for the drugs, said device comprising monitoring means and comprising time computing means, and said method comprising the steps of
- monitoring the time within a time interval between a previous time of an amount of the drugs having been taken, said previous time having been monitored and stored in the device, and a subsequent time of taking an amount of the drugs, said latter time being stored in the device,
- comparing the time interval being monitored with a pre-set time interval stored in the device, said pre-set time interval being an interval between the monitored and stored previous time of taking drugs and the subsequent time of taking drugs, and
- initiating a number of the functions reminding, registering and displaying in order to inform a person in question such as a user, a doctor, a pharmacist, a relative of a number of the following situations: a presence or non-presence of compliance, a target-level of compliance, an overall-level of compliance, a possible re-establishment of compliance after a situation of non-compliance and a possible initiation of non-compliance after a situation of compliance.

2. A method according to claim 1, said method furthermore comprising
- initiating a reminding function, said reminding function reminding the user of taking the amount of drugs, and said reminding function computing when the time interval being monitored exceeds the pre-set time interval, said reminding function comprising a number of the signalling means: visually, audible and tactile signalling.

3. A Method according to claim 1, said method furthermore comprising
- initiating a registration function, said registration function registering the time of taking the amount of drugs, and preferably also registering the actual amount of drugs taken, and said registration function comprising a number of the registering means: electronically storing in local storing means, wired transmission to foreign electronic storing means wireless transmission to foreign electronic storing means.

4. A method according to claim 1, said method furthermore comprising
- initiating a displaying function, said displaying function initially displaying the current time up till the time interval being monitored and subsequently displaying the time within the time interval being monitored, and preferably also finally displaying the time after the time interval being monitored, said displaying function comprising a number of the displaying means: any electronically displayed numerals, any plurality of light sources having the same or different colours, any graphical electronic representation in a table or a chart.

5. A method according to any of the claims 1-4, where said previous time of taking drugs is being set as an absolute time of the day, and where said subsequent time of taking drugs is being set also as an absolute time of the day.

6. Method according to any of the claims 1-4, where said previous time of taking drugs is being set as a relative time, said relative time being computed as a period of time from a time preceding the previous time of taking drugs, and where said subsequent time of taking drugs is being set as an absolute period of time computed from the previous time of taking drugs.

7. A method according to any of claim 1-4, where said previous time of taking drugs is being set as an absolute time of the day, and where said subsequent time of taking drugs is being set as a relative time, said relative time being computed as a period of time from the said previous time.

8. A method according to any of the preceding claims, where the method comprises the further steps of
- selecting and storing an intermediate time interval between a starting time of taking drugs and an end time after the starting time, and at which end time drugs no longer is allowed taken, and from said starting time and during which intermediate time interval only it is allowed for the user to take the amount of drugs, and
- monitoring, and optionally also visually displaying, the amount of time left in the said intermediate time interval up till the end time, at which end time drugs no longer is allowed taken.

9. A method according to claim 8, the method further comprising the step of monitoring, and optionally also signalling to the user, satisfactory compliance during the intermediate time interval.

10. A method according to claim 8 or claim 9, the method further comprising the step of monitoring, and optionally also signalling to the user, good compliance during a first part of the intermediate time interval and not so good compliance during a second and later part of the intermediate time interval.

11. A device comprising monitoring means for monitoring taking of drugs and comprising means for storing drugs, said device also comprising a timer, said timer being capable of computing a time interval between a previous time of taking drugs and a subsequent time of taking drugs, and said timer being capable of monitoring both absolute periods of time and relative periods of time, said absolute periods of time being periods between the previous time and the subsequent time of taking drugs.

12. A device comprising reminding means for reminding a user of time for taking drugs, said reminding means comprising a number of the signalling means: visually, audible and tactile signalling, for reminding the user, and said signalling means being differentiated according to a pre-determined level of compliance of taking the drugs.

13. A device comprising registration means for registration of time of taking an amount of drugs, and preferably also for registering the actual amount of drugs taken, and said registration means comprising a number of the storing means: local electronic storing means, foreign electronic storing means being wired connected to the registration means, foreign electronic storing means being wireless in connection with the registration means.

14. A device comprising displaying means for initially displaying a current time up till a time interval being monitored and for subsequently displaying the time within the time interval being monitored, and preferably also for finally displaying the time after the time interval being monitored, said displaying means comprising a number of the visualising means: an electronic display for numerals, a plurality of light sources having the same or different colours, an electronic display for representation of tables or charts.

15. A device comprising means for dispensing drugs, said drugs being tablets contained in a blister pack, and said device having a means for holding the blister pack, and said device furthermore comprising a monitoring means in connection with the holding means, said monitoring means intended for monitoring the presence of the blister card and intended for monitoring any non-presence of the blister card, and said device at least registering the time, when presence of the blister card in the holder is established, and the time, when non-presence of the blister card in the holder is established.

16. A daily life product being used manually, preferably being used daily, such as a calendar, a holder for shopping list, a tooth brush, a tooth brush holder, a hairbrush or comp, a bundle of keys, a wallet, an electronic product and the like and comprising means for storing drugs and comprising means for monitoring taking of drugs.

17. A stationary item being in the proximity of a user during daily life like a desktop stationary such as a pen holder, like a hand tool such as a hand drilling machine, like a dashboard item of a car such as a cup holder or the like stationary item and comprising means for storing drugs and comprising means for monitoring taking of drugs.

18. Method for monitoring, and optionally also displaying, the dispensing of drugs from a device constituting a drug storage and a dispenser for drugs in a drug container, said device comprising monitoring means and optionally also display means, and said method comprising the steps of
- monitoring, and also optionally visually signalling in the optional display, the amount of drugs in the drug container, when a new drug container is inserted for storage in the dispenser, and
- monitoring, and also optionally visually signalling in the optional display, the remaining amount of drugs in the drug container after an amount of drugs has been dispensed from the dispenser.

19. Method according to claim 18 comprising the further steps of
- monitoring, and optionally also visually signalling in the optional display, when the drug container is empty and warning of a new drug container having to be inserted.

20. Method for monitoring the dispensing of drugs from a device constituting a drug storage and a dispenser for drugs in a drug container, and said device having means for storing data with information related to a dosage plan for the dispensing of the drugs, said dispenser comprising a monitor, and optionally also comprising a display, and said method comprising the step of selecting and storing in the data storing means a time at which an amount of drugs is to be taken and said method comprising the steps of
- selecting and storing an initial time interval before the time for dispensing drugs during which time interval it is allowed to take the amount of drugs, and
- monitoring, and optionally also visually signalling in the optional display, the amount of time left in the time interval before the time at which the drugs is to be taken.

21. Method according to claim 20, the method further comprising the step of
- monitoring, and optionally also visually signalling in the display, good compliance during the time interval before the time at which the drugs is to be taken.

22. Method according to claim 20 or claim 21, the method further comprising the step of monitoring, and optionally also signalling to the user, a change from not so good compliance to good compliance, when the drugs to be taken have been taken during the initial time interval.

23. Method for monitoring the dispensing of drugs from a device constituting a drug container and a dispenser for drugs in a drug container, and having means for storing data with information related to the dispensing of the drugs, said device comprising a monitor, and optionally also comprising a display, and said method comprising the step of selecting and storing in the data storing means a time at which an amount of drugs is to be taken and said method comprising the steps of
- selecting and storing a subsequent intermediate time interval after the starting time after which end time the amount of drugs is to be taken, and during which subsequent intermediate time interval it is allowed to take the drugs
- monitoring, and optionally visually signalling in the optional display, the amount of time left in the subsequent intermediate time interval after the starting time.

24. Method according to claim 23, the method further comprising the step of
- monitoring, and optionally also visually signalling in the optional display, bad compliance if the amount of drugs has not been taken yet during the intermediate time interval and after end time, before which end time the amount of drugs is to be taken.

25. Method according to claim 23, the method further comprising the step of - monitoring, and optionally also visually signalling in the optional display, both good compliance and bad compliance if the amount of drugs has not been taken yet during the subsequent intermediate time interval after the starting time.

26. Method according to claim 24 or claim 25, the method further comprising the step of - monitoring, and optionally also visually signalling in the optional display, a change in the indication from bad compliance to good compliance, when the amount of drugs to be taken has been taken during the subsequent intermediate time interval after the starting time and before the end time.

27. Device for dispensing of drugs from a drug container, said device comprising a compartment for storing the drug container with an amount of drugs enclosed therein, and comprising means at least for dispensing the drugs out of the device, and comprising an outlet for dispensing of at least one amount of drugs from the drug container and further out of the device, and comprising monitoring means, and optionally also a display means, for at least monitoring, and optionally also displaying, information concerning the use of the device, and said monitoring means and optional display means being capable of indicating the amount of drugs in a newly inserted and stored drug container.

28. Device according to claim 27, said monitoring means, and preferably also said optional display means furthermore being capable of monitoring, and the optional display means indicating, the amount of drugs left in the drug container, when an amount of drugs has been let out of the drug container and have been dispensed further out of the device.

29. Device for dispensing of drugs from a drug container, said device comprising a compartment for storing the drug container with an amount of drugs enclosed therein, and comprising means at least for dispensing the drugs out of the drug container, and comprising data related to a dosage plan with information related to dispensing of drugs from the drug container and further out of the device, and said device comprising a monitoring means, and optionally also display means, for at least monitoring, and optionally also displaying, information concerning the use of the device, said display means being capable of indicating that compliance according to the information of the dosage plan is not present if the drugs to be taken has not been taken.

30. Device according to claim 29, said monitoring means, and preferably also said optional display means, furthermore being capable of monitoring, and the optional display means indicating, that compliance according to the information of the dosage plan is present if the drugs to be taken has been taken.

31. Device according to claim 29 and claim 30, said monitoring means, and preferably also said optional display means, furthermore being capable of monitoring, and the optional display means indicating, that compliance according to the information of the dosage plan

is not present, but can be established, if the drugs to be taken have not been taken, but may still be taken for thereby establishing compliance.

32. Device according to any of claims 27 or claim 28, said monitoring means, and preferably also said optional display means, furthermore being capable of monitoring, and the optional display means indicating, when no drugs is left in the drug container, when all the amount of drugs has been let out of the drug container and has been dispensed further out of the device.

33. Device according to any of claim 27-32, said device being operated by a battery, and said display means being capable of indicating the remaining lifetime of the battery operating the device.

34. Device according to claim 33, said display means being capable of indicating when no remaining lifetime of the battery is left, the indication preferably being displayed before the lifetime of the battery expires.

35. Use of a device according to any of claims 27-34 for monitoring the dispensing of drugs from a drug container being stored in the device, preferably for monitoring the dispensing of tablets from a blister pack in the device.

36. Use of a device according to any of claims 27-34 for displaying the dispensing of drugs from a drug container being stored in the device, preferably for displaying dispensing of tablets from a blister pack in the device.

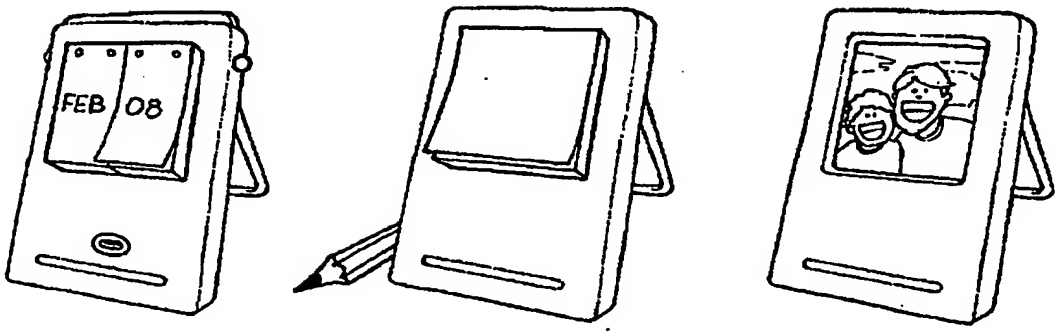


FIG. 1

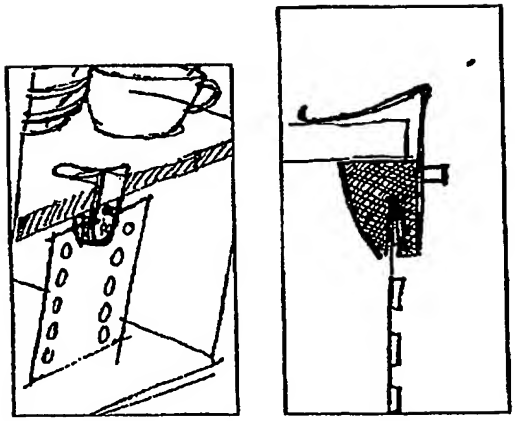


FIG. 2

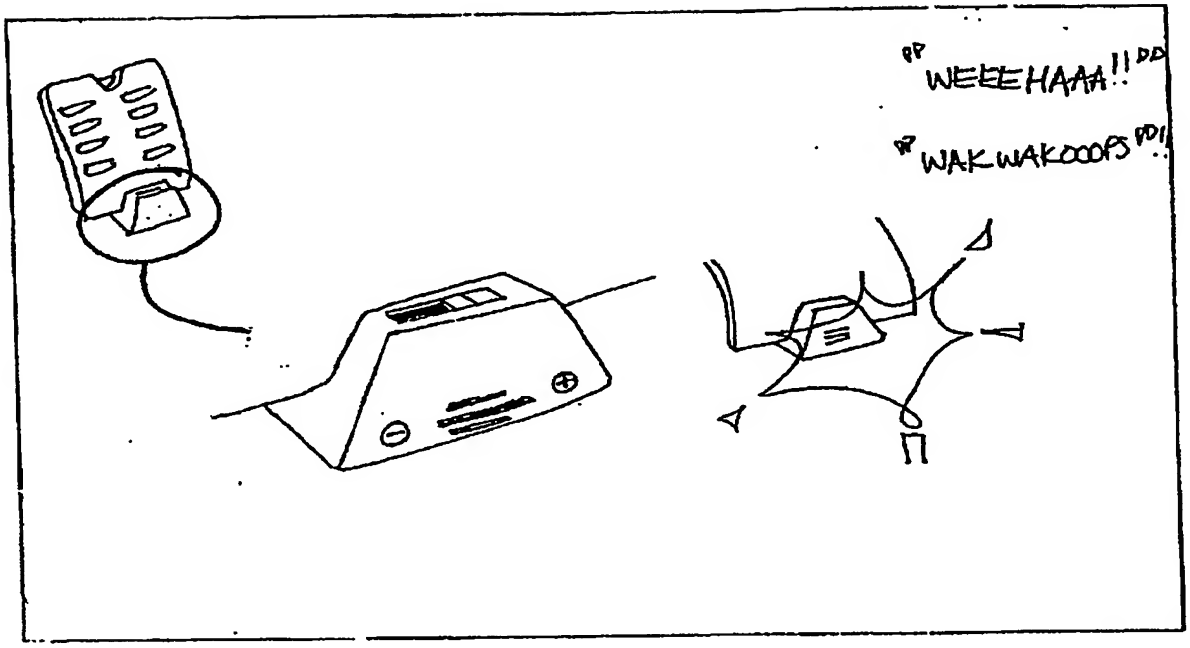


FIG. 3

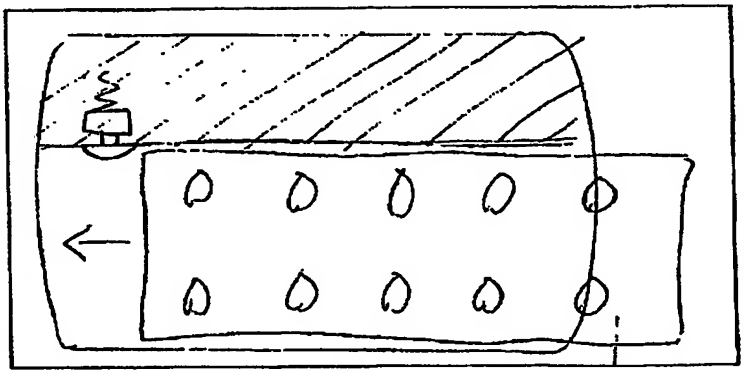


FIG. 4

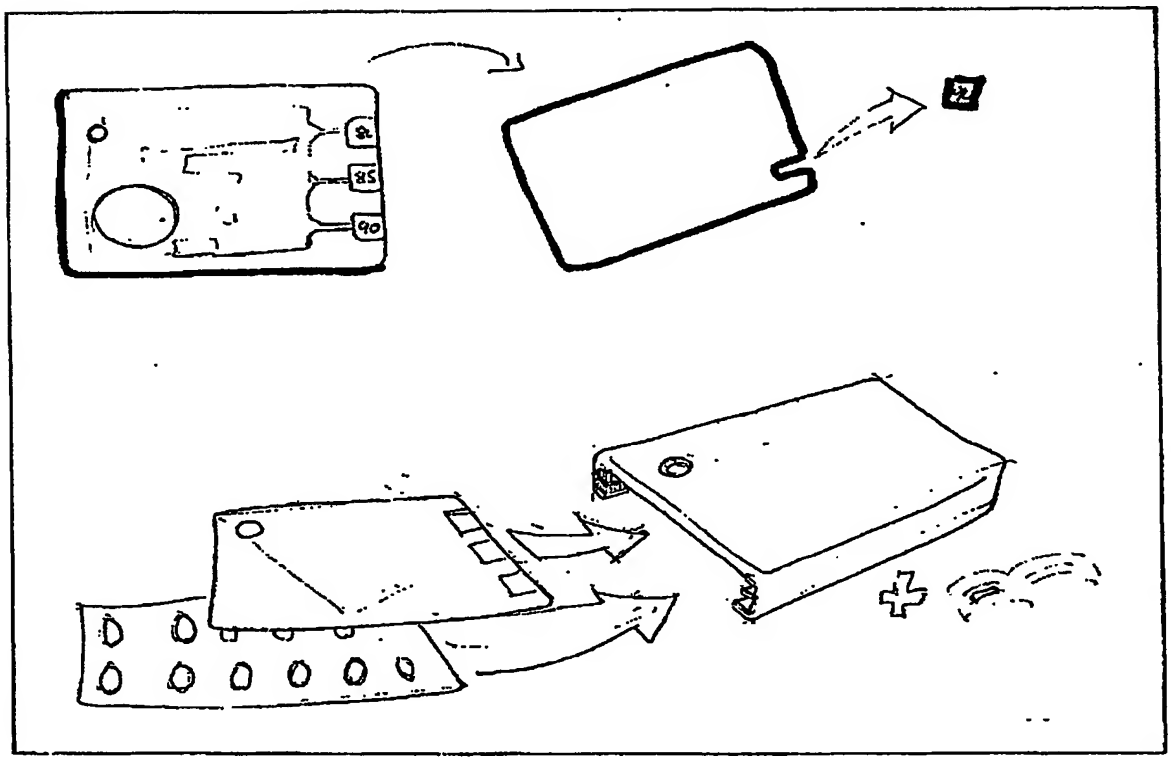


FIG. 5

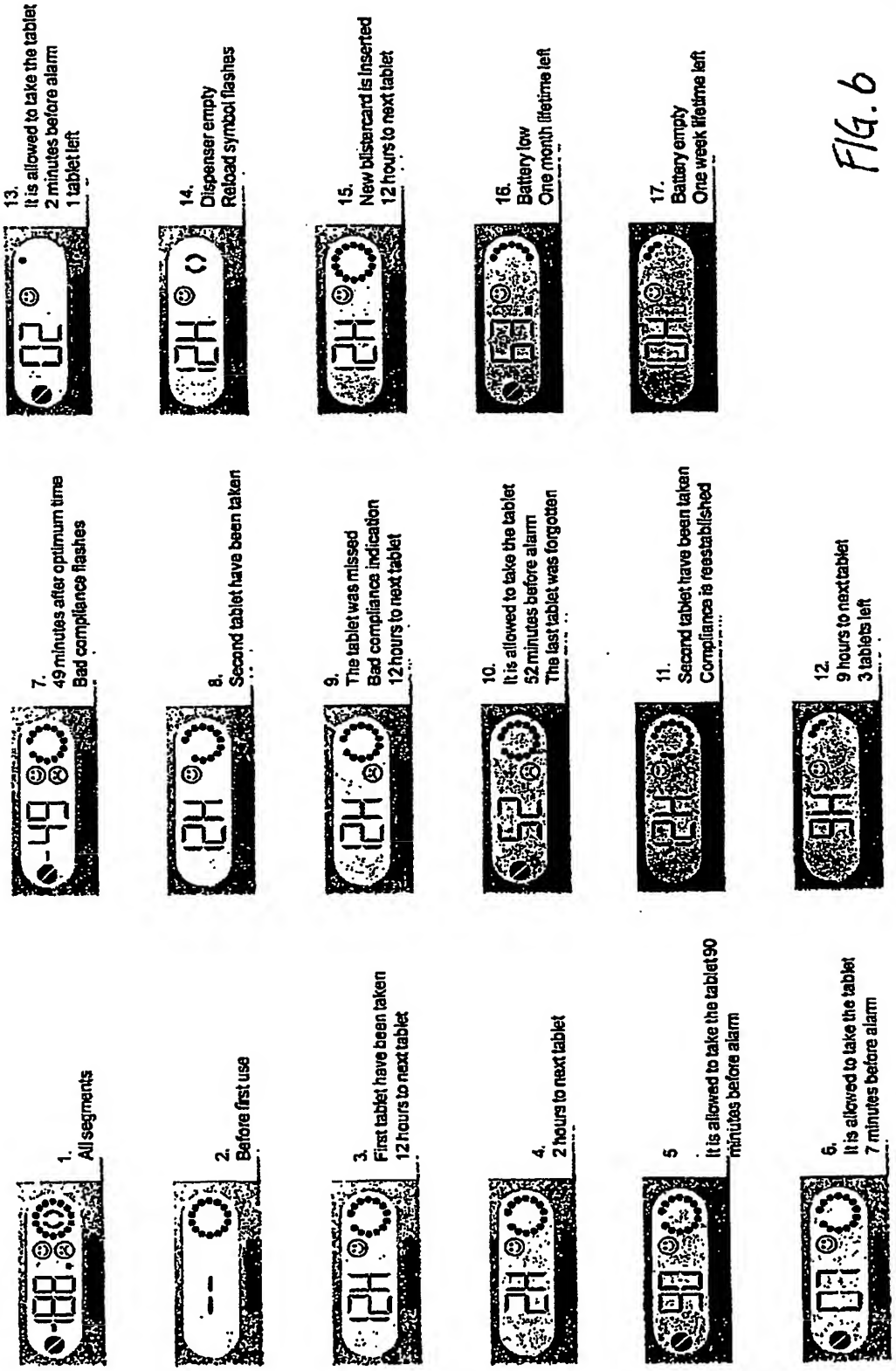
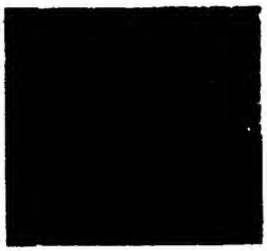


FIG. 6



Artist Bjørn Syrenholt

Patent- og Varemærkestyrelsen
Helgeshøj Allé 81
2630 Taastrup

VIA TELEFAX (1/19)
OG POSTKOPI

7. marts 2002

Ny dansk patentansøgning
Bang & Olufsen Medicom A/S
Vores ref: 31932 DK 01

Ny dansk patentansøgning

Vedlagt fremsendes ny dansk patentansøgning. Ansøgningen fremsendes tillige pr. post.

Med venlig hilsen

Plougmann & Vingtoft a/s

Steen Iver Andersen

Plougmann & Vingtoft
intellectual property consulting

Copenhagen
Plougmann & Vingtoft a/s
Sankt Annæ Plads 11
Post Office Box 3007
DK - 1021 Copenhagen K
CVR. No. 18 60 97 03
Telephone +45 33 63 93 00
Telefax +45 33 63 96 00
e-mail pv@pv.dk
www.pv.dk

Aarhus
Plougmann & Vingtoft
Arolgaarden
Åboulevarden 23
Post Office Box 49
DK - 8100 Aarhus C
Telephone +45 87 32 '8 00
Telefax +45 33 63 96 00
e-mail pv@pv.dk
www.pv.dk

A subsidiary of Intellectual Property Holding a/s represented in Copenhagen Aarhus Gothenburg Helsingborg Linköping Lund Malmö Ronneby Stockholm Munich Reykjavik Alicante

Ansøgningsskema
Beskrivelse og krav
Tegninger

FAXED TO NO.: 4350 8001 PAGES 20

Patentansøgning

Patent- og Varemærkestyrelsen
Erhvervsministeriet

Helgeshøj Allé 81
2630 Taastrup

Tlf. 43 50 80 00
Fax 43 50 80 01
Postgiro 8 989 923
E-post pvs@dkpto.dk
www.dkpto.dk

Læs venligst vejledningen til de enkelte punkter

2. Ansøgers fuldmægtigs referencenr.:
P13917DK00/NHG/ar

3. International indleveringsdag: ☐ Kapitel I
Internationalt ansøgningsnr.: ☐ Kapitel II

4. Ansøger (fulde navn, adresse og evt. CVR-nr.): ☐ Flere ansøgere på bagsiden

LINDHOLST & CO. A/S
Vestermøllevej 9
8380 Trige

Telefon: Telefax:

5. Fuldmægtig (navn og adresse):
PATRADE A/S
Fredens Torv 3A
8000 Aarhus C

Telefon: 7020 3770 Telefax: 7020 3771

6. Opfinder (fornavn, efternavn, adresse):
Claus Andersen
Tåstrupvej 31, Selling
8370 Hadsten

6a. Opfinder (fornavn, efternavn, adresse): ☒ Flere opfindere på bagsiden
Torben Andersen
Baunehøjvej 22
8500 Grenå

7. Opfindelsens benævnelse:
Indfødningssystem

8. Prioritetspåstand(e): ☐ Flere prioritetspåstande på bagsiden

Dato	Land	Nr.
Dato	Land	Nr.
Dato	Land	Nr.

9. ☐ Ansøgningen omfatter deponering af en prøve af biologisk materiale, som angivet i patentlovens § 8a, stk.1.

10. ☐ Ansøgningen omfatter en sekvensliste.

11. ☐ Ansøgningen er fremkommet ved deling eller udskillelse.
Stamansøgningens nr.: Ansøgt løbedag:

13. ☐ Ansøgningen er tidligere indleveret pr. telefax den:

14. Dato og underskrift:
25. marts 2002
PATRADE A/S

1.1-mar00/tc

1. Gebyrer:
☒ Ansøgningsgebyr
☐ Kravgebyr
☐ ITS-nyhedsundersøgelsesgebyr

12. Bilagsfortegnelse:
☐ fremmedsproget beskrivelse
☒ dansk beskrivelse i 1 ekspl.
☒ sammendrag i 1 ekspl.
☒ tegninger i 1 ekspl.
☐ prioritetsdokument
☐ fuldmagt
☐ overdragelsesdokument
☐
☐
Fig nr. 3 ønskes publiceret sammen med sammendraget.

15. Behandling af fremmedsproget ansøgning m.m. ønskes
☐ norsk
☐ svensk
☐ engelsk

PA 2002 00454

Ansøgere fortsat

Ansøger (fulde navn og adresse):

Telefon: Telefax:

Ansøger (fulde navn og adresse):

Telefon: Telefax:

Opfindere fortsat

Opfinder (fornavn, efternavn, adresse):

Michael Bang
Kermindevej 4
8680 Ry

Opfinder (fornavn, efternavn, adresse):

Henrik Ovesen
Egesvinget 1
8400 Ebeltoft

Opfinder (fornavn, efternavn, adresse):

Opfinder (fornavn, efternavn, adresse):

Prioritetspåstande fortsat

Dato	Land	Nr.
Dato	Land	Nr.
Dato	Land	Nr.
Dato	Land	Nr.
Dato	Land	Nr.
Dato	Land	Nr.

P13917DK00
2002.03.25/NG

Lindholst & Co. A/S
Vestermøllevej 9
8330 Trige

Indfødningssystem.

Den foreliggende opfindelse angår et indfødningssystem til indfødning af emner, f.eks. kyllingedele, fra en båndtransportør til en anden båndtransportør, og af den i indledningen til krav 1 angivne art.

Kendte indfødningssystemer af denne art, hvor emnerne normalt overføres fra en første båndtransportør til en anden båndtransportør via en båndvægt, der styringsmæssigt samvirker med en efterkoblet sorteringsbåndtransportør, omfatter til den aktive overførsel af emnerne et særligt indføringsaggregat, der består af en rotor eller en kort endeløs båndtransportør med "skrabeplader", der bevæges vinkelret på nævnte første båndtransportør, og som er indrettet til aktivt at skrabe eller skubbe emnerne ud på den anden båndtransportør. De nævnte medbringerplader er placeret i en vinkel i forhold til transportretningen, således at indføringsaggregatets nævnte "skrabeplader" får længst mulig tid til at skrabe eller skubbe emnerne ud på den anden båndtransportør.

Det forhold at medbringerpladerne er vinkelstillet i forhold til transportretningen medfører flere ulemper. Der anvendes båndtransportører, der består af relativ korte, bredde kædeled, hvor det er vanskeligt at fastgøre medbringerpladerne, idet disse - af hensyn til omstyring imellem øvre og nedre løb af transportøren - kun kan være fastgjort til ét kædeled, dvs. at den "løse" udragende del af medbringerpladerne, som forløber ind over et naboled, ofte kun er til besvær, fordi dens bevægelse er ukontrollabel. Desuden umuliggør tilstedeværelsen af vinkelstillede medbringerplader med udragende "løse" dele, der i transportretningen strækker sig over flere kædeled, at båndtransportøren kan føres opad, f.eks. hen over maskindele eller gangarealer. Svingning i det vandrette plan af båndtransportører med sådanne vinkelstillede medbringerplader med udragende "løse" dele er ligeledes besværligt og pladskrævende, fordi det i givet fald vil kræve meget store svingdiametre.

Opfindelsen har til formål at angive et indfødningssystem af den indledningsvis nævnte art, og som på enkel måde gør det muligt at undgå de ovenfor nævnte ulemper.

Indfødningssystemet ifølge opfindelsen er kendetegnet ved, at nævnte medbringerplader af nævnte første båndtransportør forløber i hovedsagen vinkelret på transportørens

transportretning, og at nævnte første båndtransportør er vinkelstillet i forhold til en indfødningsende af nævnte båndvægt eller nævnte anden båndtransportør. På enkel måde opnås herved sikkerhed for, at der bliver den fornødne tid til, at nævnte pladeformede skrabere af indfødningsaggregatet kan nå at indføde emnerne fra nævnte første båndtransportør, selvom denne er opdelt i "kamre" ved hjælp af medbringere, der med indbyrdes afstand forløber i hovedsagen vinkelret på transportretningen af nævnte første båndtransportør.

Hensigtsmæssigt er indfødningssystemet ifølge opfindelsen således udformet, at vinklen mellem nævnte første båndtransportør og indfødningsenden af nævnte båndvægt eller nævnte anden båndtransportør er af størrelsesordenen 5° - 45°. I den forbindelse skal det nævnes, at den aktuelle vinkel mellem nævnte første båndtransportør og indfødningsenden af nævnte båndvægt eller nævnte anden båndtransportør er produktspecifik, idet vinklen ved meget små emner vil være ca. 5° stigende til ca. 45° ved meget store eller lange emner, idet naturligvis også båndbredde og den indbyrdes afstand imellem frembringerpladerne har betydning.

Alternativt kan indfødningssystemet ifølge opfindelsen være således udformet, at vinklen mellem nævnte første båndtransportør og indfødningsenden af nævnte båndvægt eller nævnte anden båndtransportør er 90°, og at nævnte indfødningsaggregat udgøres af en endeløs båndtransportør med en kulissestyring for nævnte skraberplader, hvilken kulissestyring er indrettet til at også at give skraberplader en bevægelseskomponent i transportretningen af nævnte første båndtransportør.

Indfødningssystemet ifølge opfindelsen kan yderligere hensigtsmæssigt være således udformet, at den indbyrdes afstand imellem medbringerpladerne henholdsvis bevægelseshastigheden af nævnte første båndtransportør og af nævnte indfødningsaggregat er tilpasset en overførselsfrekvens af størrelsesordenen 3 - 5 emner pr. sek.

Med henblik på at tilsikre at skraberpladerne med sikkerhed slipper emnerne på nævnte båndvægt eller nævnte anden båndtransportør kan indfødningssystemet ifølge opfindelsen være således udformet, at nævnte indfødningsaggregat udgøres af en

overhængt, endeløs båndtransportør, der ved en ydre endedel er udformet med et således opadrettet skråt forløb, at skraberpladerne løftes fri fra nævnte båndvægt eller nævnte anden båndtransportør. Med samme formål kan det være hensigtsmæssigt, at transporthastigheden af nævnte båndvægt eller nævnte anden båndtransportør er lidt større end transporthastigheden af indfødningsaggregatet.

Opfindelsen forklares i det følgende nærmere med henvisning til tegningen, på hvilken:

Fig. 1 viser et plant billede af et kendt indfødningssystem med en første båndtransportør med vinkelstillede medbringerplader,

fig. 2 viser et plant billede af en udførelsesform for et indfødningssystem ifølge opfindelsen,

fig. 3 viser et plant ovenbillede af et anlæg med en foretrukken udførelsesform for et indfødningssystem ifølge opfindelsen,

fig. 4 viser et billeder af en udførelsesform for en første båndtransportør til et indfødningssystem ifølge opfindelsen,

fig. 5 viser båndtransportøren jf. fig. 4 med transportemner i form af kyllingedele,

fig. 6 viser et billede af en foretrukken udførelsesform for et indfødningssystem ifølge opfindelsen,

fig. 7 viser et billede af det i fig. 6 viste indfødningssystem med ifyldte transportemner i form af kyllingedele,

fig. 8 viser et detailbillede af et indfødningssystem ifølge opfindelsen,

fig. 9 viser et yderligere detailbillede af det i fig. 8 viste indfødningssystem ifølge opfindelsen, og

fig. 10 viser et billede af en prøveopstilling af et anlæg med et indfødningssystem ifølge opfindelsen.

En udførelsesform for et kendt indfødningssystem 2 er vist i fig. 1, hvor en første båndtransportør 4 har opstående medbringerplader 6, der er vinkelstillet ca. 70° i forhold til transportretningen af båndtransportøren 4, der har et forløb vinkelret på en båndvægt 8 og en anden båndtransportør 10. I overgangszonen imellem den første båndtransportør 4 og båndvægten 8 er placeret et indfødningsaggregat 12, der på kendt måde er udformet en valse eller et endeløst bånd med pladeformede skrabere, der successivt sørger for aktivt at afskrabe og overføre ankommende emner, f.eks. kyllingedele, som er placeret imellem medbringerpladerne 6 af båndtransportøren 4, til den anden båndtransportør 10 via båndvægten 8. Vinkelstillingen af medbringerpladerne 6 har til formål, at understøtte funktionen af indfødningsaggregatets pladeskrabere, der herved får lidt længere tid til at sørge for den aktive overføring af emnerne til båndvægten 8, idet vinkelstillingen af medbringerpladerne 6 "forsinker" ankomsten af disse til indfødningsaggregatet 12.

I praksis medfører det imidlertid ulemper, at medbringerpladerne 6 er vinkelstillet i forhold til drejeleddene imellem de enkelte led af båndtransportøren 4, fordi de enkelte båndled normalt en meget smalle, dvs. at medbringerpladerne 6, der - af hensyn til transportbåndets omstyring imellem det øvre aktive løb og det nedre passive løb - kun kan være fastgjort til et båndled. Det forhold at medbringerpladerne 6 har udragende, "løse" endedele betyder desuden, at svingning i det vandrette plan bliver besværliggjort henholdsvis er meget pladskrævende. Endelig er det en ulempe, at de udragende, "løse" endedele af medbringerpladerne 6 umuliggør opad-føring af båndtransportøren 4, f.eks. hen over maskindele og gangarealer.

I fig. 2 er vist en udførelsesform for et indfødningssystem 14 ifølge opfindelsen, hvor en første båndtransportør 16 er forsynet med medbringerplader 18, der er indbyrdes

parallelle, og som står vinkelret på transportretningen. Båndtransportøren 16 er vinkelstillet i forhold til en båndvægt 20 og en anden båndtransportør 22, idet båndtransportøren 16 - i det i fig. 2 viste eksempel - er placeret vinkelret i forhold til båndvægten 20 henholdsvis båndtransportøren 22. Båndtransportøren 16 kan således på grund af, at medbringerpladerne 18 - selv med stor længde - i fuld udstrækning kan være fastgjort til bare et båndled, have både opad- og nedadgående forløb, dvs. uden problemer kan føres op over maskindele og gangarealer, ligesom

I overgangszonen imellem den første båndtransportør 16 og båndvægten 20 er placeret et indfødningsaggregat 24, der er udformet med et endeløst bånd med pladeformede skrabere, hvis bevægelse på tværs af den første båndtransportør 16 er styret af en særlig kulissestyring 26, således at pladeskraberne herved - som et alternativ til vinkelstillingen af medbringerpladerne 6 jf. fig. 1 - får bedre tid til successivt at sørge for aktivt at afskrabe og overføre ankommende emner, f.eks. kyllingedele, som er placeret imellem medbringerpladerne 18 af båndtransportøren 16, til den anden båndtransportør 22 via båndvægten 20.

En foretrukken udførelsesform for et indfødningssystem 26 ifølge opfindelsen er vist i fig. 3, der viser et anlæg som af pladshensyn er sammenbygget, og som er indrettet til dannelse af portioner af kyllingedele, nemlig vinger, der tilføres via en første båndtransportør 28, og brystfiletter, der tilføres via en første båndtransportør 28'. Begge båndtransportører 28 og 28' er forsynet med indbyrdes parallelle medbringerplader 30 og 30', således at båndtransportørerne 28 og 28' uden problemer - som vist - kan føres gennem både højre- og venstresving i det vandrette plan.

I det i fig. 3 viste eksempel ankommer båndtransportøren 28 med vinger til en båndvægt 32 med en vinkelstilling på ca. 15° - i praksis kan denne vinkelstilling variere fra 5° - 25°. Båndtransportøren 28' med brystfiletter ankommer med en tilsvarende vinkelstilling på ca. 15° til en båndvægt 32' via en smal mellemkoblet båndtransportør 29 med ekstra høj transporthastighed for at fremskynde ankomsten af brystfiletterne til båndvægten 32'. Overførslen af henholdsvis vinger og brystfiletter foregår ved hjælp af indfødningsaggregater 34 og 34', hvis indretning forklares nærmere nedenfor i for-

6

bindelse med fig. 8 og 9. Efter båndvægtene 32 og 32' overføres vinger henholdsvis brystfiletter til en sammenbygget sorteringstransportør 36 med en central skilleplade 38, og med vægtstyrede afkasterarme 40 langs begge sider.

Fig. 4 viser en udførelsesform for en første båndtransportør 42 i form af en endeløs transportør, der består af relativt brede båndled af plast og med indbyrdes parallelle, opstående medbringerplader 44 og sidekanter 46. I højre side ses et blødt højresving, hvor sidekanterne 46 er erstattet af buede sideskinner 48 af plast. Fig. 5 viser igen den i fig. 4 viste båndtransportør 42 nu med kyllingedele anbragt imellem frembringerpladerne 44 og sidekanter 46 henholdsvis buede sideskinner 48.

Fig. 6 viser en udførelsesform for et indfødningssystem 50 ifølge opfindelsen med en første båndtransportør 52, et indfødningsaggregat 54 og en båndvægt 56, der er efterkoblet en ikke vist anden båndtransportør, f.eks. en sorteringstransportør eller grader. Den samme udførelsesform er vist i fig. 7 under indfødning af kyllingedele fra den første båndtransportør 52 via indfødningsaggregatet 54 til båndvægten 56.

Det i fig. 8 viste indfødningsaggregat 54 - hvor en afskærmning 53 er svunget op - omfatter et hurtigtløbende, endeløst bånd 58 med et antal pladeformede skrabere 60, der på det nedre fremadrettede løb sørger for den aktive overførsel af emner, f.eks. kyllingedele, fra en første båndtransportør 52 til en anden båndtransportør (ikke vist) via en båndvægt 56. En forreste endedel 62 af indfødningsaggregatet 54 har et opadbuet forløb, således at de pladeformede skrabere 60 umiddelbart efter, at de har overført emnet til båndvægten 56, løftes fri opad, således at skraberne 60 ikke kan komme i vejen for det næste emne. I den forbindelse skal det nævnes, at transporthastigheden af båndvægten 56 er noget større end transporthastigheden af indfødningsaggregatet 54, hvis hastighed igen er nøje afstemt efter transporthastigheden af den første båndtransportør 52, således at indfødningsaggregatets skrabere 60 ikke kommer i karambolage med frembringerpladerne 44 af den første båndtransportør 52.

Overførslen af emner mellem den første båndtransportør 52 og båndvægten 56 foregår med en så stor hastighed, at emnerne under overførslen fortsat kan have en bevægel-

seskomponent på tværs af overførselsretningen, hvorfor båndvægten 56 på den allerførste del - ud for endedelen 62 af indfødningsaggregatet 54 - er forsynet med indstillelige sidevægge 64, således at emnerne holdes sideværts på plads på båndvægten 56. Disse sidevægge 64 ses tydeligst i fig. 9, hvor den endeløse båndtransportør 58 af indfødningsaggregatet 54 er svunget opad til en rengøringsposition.

Fig. 10 viser et eksempel af en værksteds-prøveopstilling af et indfødningssystem 66 ifølge opfindelsen med en første båndtransportør 68, der umiddelbart efter en skråtstillet indfødningstransportør 70 forløber i en højresvings-bue 72, derefter opad 74, henover 76, nedad 78 - over et gangareal (eller en maskindel) - derefter en venstresvingsbue 80, en lige strækning 82, et bue forløb 84 umiddelbar foran et indfødningsaggregat 54.

PATENTKRAV

1. Indfødningssystem til indfødning af emner, f.eks. kyllingedele, fra en første båndtransportør, der er forsynet med medbringerplader, f. eks. via en båndvægt til en anden båndtransportør, hvilket indfødningssystem omfatter et indfødningsaggregat i form af en valse eller en endeløs båndtransportør med pladeformede skrabere, der er indrettet til at bevæges imellem nævnte medbringerplader og udføre den aktive successive overføring af emner fra nævnte første båndtransportør til nævnte anden båndtransportør, ***kendetegnet*** ved, at nævnte medbringerplader af nævnte første båndtransportør forløber i hovedsagen vinkelret på transportørens transportretning, og at nævnte første båndtransportør er vinkelstillet i forhold til en indfødningsende af nævnte båndvægt eller nævnte anden båndtransportør.

2. Indfødningssystem ifølge krav 1, ***kendetegnet*** ved, at vinklen mellem nævnte første båndtransportør og indfødningsenden af nævnte båndvægt eller nævnte anden båndtransportør er af størrelsesordenen 5° - 45°.

3. Indfødningssystem ifølge krav 1, ***kendetegnet*** ved, at vinklen mellem nævnte første båndtransportør og indfødningsenden af nævnte båndvægt eller nævnte anden båndtransportør er 90°, og at nævnte indfødningsaggregat udgøres af en endeløs båndtransportør med en kulissestyring for nævnte skraberplader, hvilken kulissestyring er indrettet til at også at give skraberplader en bevægelseskomponent i transportretningen af nævnte første båndtransportør.

4. Indfødningssystem ifølge krav 1, ***kendetegnet*** ved, at den indbyrdes afstand imellem medbringerpladerne henholdsvis bevægelseshastigheden af nævnte første båndtransportør og af nævnte indfødningsaggregat er tilpasset en overførselsfrekvens af størrelsesordenen 3 - 5 emner pr. sek.

5. Indfødningssystem ifølge krav 1, ***kendetegnet*** ved, at nævnte indfødningsaggregat udgøres af en overhængt, endeløs båndtransportør, der ved en ydre endedel er

udformet med et således opadrettet skrået forløb, at skraberpladerne løftes fri fra nævnte båndvægt eller nævnte anden båndtransportør.

6. Indfødningssystem ifølge krav 1, ***kendetegnet*** ved, at transporthastigheden af nævnte båndvægt eller nævnte anden båndtransportør er lidt større end transporthastigheden af indfødningsaggregatet.

SAMMENDRAG

Der beskrives et indfødningssystem (26) til indfødning af emner, f.eks. kyllingedele, fra en første båndtransportør 28, der er forsynet med medbringerplader (30), f. eks. via en båndvægt (32) til en anden båndtransportør (36), hvilket indfødningssystem omfatter et indfødningsaggregat (34) i form af en valse eller en endeløs båndtransportør med pladeformede skrabere, der er indrettet til at bevæges imellem nævnte medbringerplader og udføre den aktive successive overføring af emner fra nævnte første båndtransportør (28) til nævnte anden båndtransportør (36), hvor nævnte medbringerplader af nævnte første båndtransportør (28) forløber i hovedsagen vinkelret på transportørens transportretning, og hvor nævnte første båndtransportør (28) er vinkelstillet i forhold til en indfødningsende af nævnte båndvægt (32) eller nævnte anden båndtransportør (36). På enkel måde opnås herved sikkerhed for, at der bliver den fornødne tid til, at nævnte pladeformede skrabere af indfødningsaggregatet kan nå at indføde emnerne fra nævnte første båndtransportør, selvom denne er opdelt i "kamre" ved hjælp af medbringere, der med indbyrdes afstand forløber i hovedsagen vinkelret på transportretningen af nævnte første båndtransportør.

(Fig. 3)

Fig. 1

Fig. 2

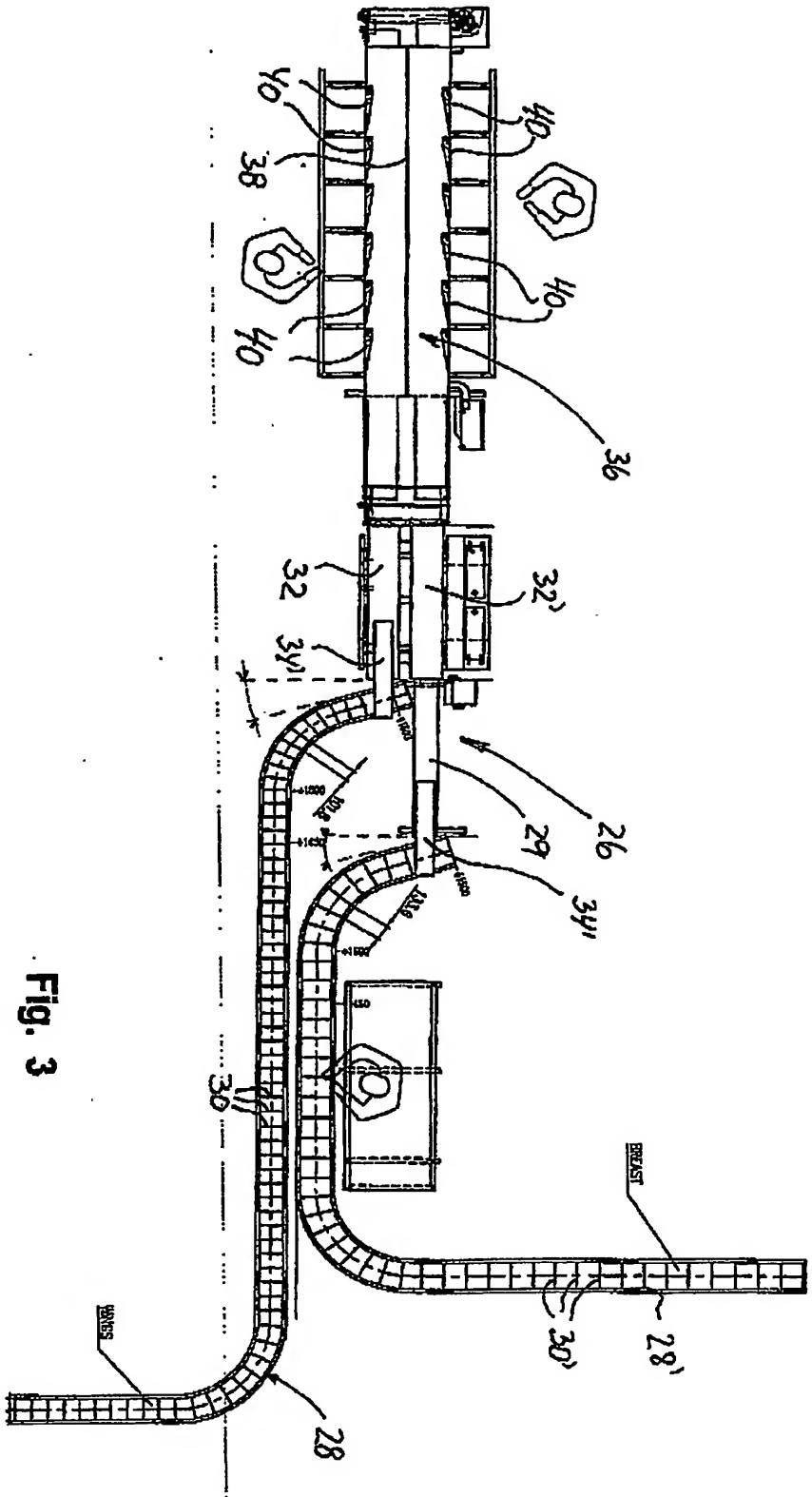


Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 8

Fig. 9

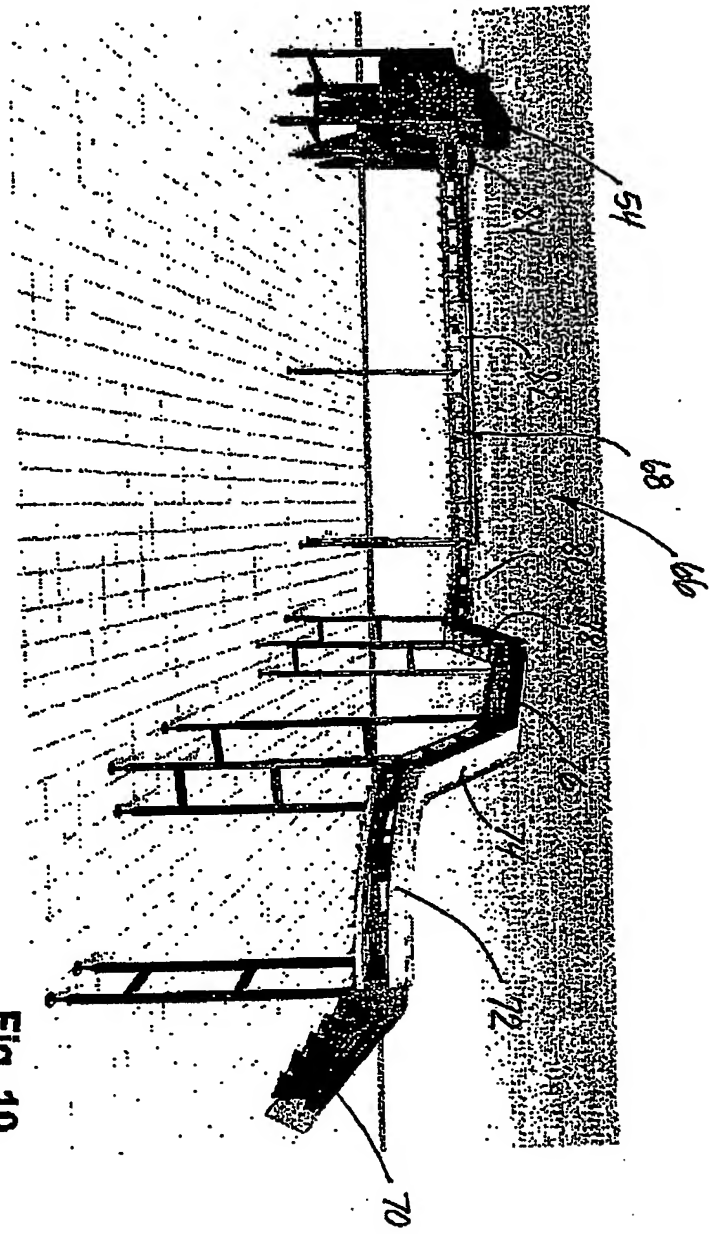


Fig. 10